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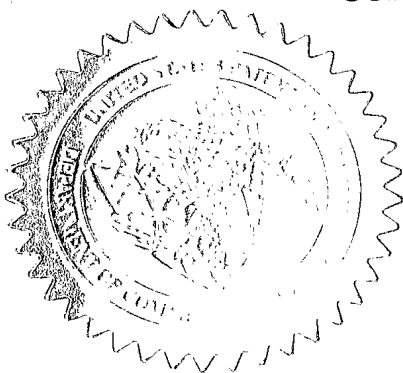
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This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

Express Mail Label No.

EV196728351US

**INVENTOR(S)**

Given Name (first and middle [if any])	Family Name or Surname	Residence (City and either State or Foreign Country)
Dan	Pellerin	Howell, Michigan
Boris	Teper	Farmington Hills, Michigan
Brian	Hoy	Brighton, Michigan

☐ Additional inventors are being named on the \_\_\_\_\_ separately numbered sheets attached hereto**TITLE OF THE INVENTION (500 characters max)**

ASSEMBLY LINE FOR MOUNTED UNITS

Direct all correspondence to:

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☐ Firm or  
Individual Name

Gregory D. DeGrazia/Howard &amp; Howard Attorneys, P.C.

Address

The Pinehurst Office Center, Suite #101

Address

39400 Woodward Avenue

City

Bloomfield Hills

State

Michigan

ZIP

48304-5151

Country

U.S.A.

Telephone

(248) 723-0325

Fax

(248) 645-1568

**ENCLOSED APPLICATION PARTS (check all that apply)**☒ Specification Number of Pages

11

☐ CD(s), Number☒ Drawing(s) Number of Sheets

8

☐ Other (specify)☐ Application Data Sheet. See 37 CFR 1.76**METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT**☐ Applicant claims small entity status. See 37 CFR 1.27.☐ A check or money order is enclosed to cover the filing fees☒ The Commissioner is hereby authorized to charge filing  
fees or credit any overpayment to Deposit Account Number:

08-2789


☐ Payment by credit card. Form PTO-2038 is attached.FILING FEE  
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The invention was made by an agency of the United States Government or under a contract with an agency of the  
United States Government.☒ No.☐ Yes, the name of the U.S. Government agency and the Government contract number are: \_\_\_\_\_

Respectfully submitted,

SIGNATURE



TYPED or PRINTED NAME Gregory D. DeGrazia

TELEPHONE (248) 723-0325

Date 02/07/2003

REGISTRATION NO.  
(if appropriate)  
Docket Number:

48,944

60,568-005

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This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, D.C. 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Box Provisional Application, Assistant Commissioner for Patents, Washington, D.C. 20231.

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I hereby certify that the enclosed **PROVISIONAL APPLICATION** and fee is being deposited with the United States Postal Service as Express Mail, postage prepaid, in an envelope as "Express Mail Post Office to Addressee", Mailing Label No. **EV196728351US** and addressed to the Assistant Commissioner of Patents, Washington, D. C. 20231, on **February 7, 2003**.

*Anne L. Kubit*

Anne L. Kubit

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EXPRESS MAIL LABEL NO. EV196728351US

PROVISIONAL APPLICATION ENTITLED:

**ASSEMBLY LINE FOR MOUNTED UNITS**

**Inventor(s):** Dan Pellerin  
**Address:** 1372 Roberta Court  
Howell, MI 48843

Boris R. Teper  
29383 Breeze Wood  
Farmington Hills, MI 48331

Brian Hoy.  
5634 Mountain Road  
Brighton, MI 48116

## BACKGROUND OF THE INVENTION

## 1. Field of the Invention

5                    **[0001]**                    The subject invention relates to an assembly line for mounting  
tires upon wheels.

## 2. Description of the Prior Art

[0002] Numerous assembly lines for mounting tires on their mounting wheels and other assembly lines for mounted units are known in the prior art and are widely used today in the automotive industry. Generally, the assembly lines, known in the art, contain conveying means, such as conveyor belts or metal rollers making it possible to route the tires, wheels and mounted assemblies, respectively, from one point to another on the assembly line. The tires and wheels are delivered from a supply warehouse by means of suitable pallets to be further mounted on the assembly line and delivered to customers. On the assembly line, the seats of each wheel rim are lubricated, the wheels are centered, and the beads of the tire are lubricated to facilitate the mounting of the tire on the wheel rim, upon completion of which the tire is inflated and checked for air pressure level to meet the requirements of an automotive industry.

20 [0003] Various prior art patents, such as United states Patent Nos.  
6,199,270 to Menard et al., 6,298,281 to Menard et al., 6,422,097 to Menard et al.,  
6,176,288 to Kane et al., 6,119,514 to Piacente et al, 6,082,191 to Neiferd et al.,  
4,947,919 to Timlin, and 4,886,101 to Kinnick et al. describe assembly lines and  
machines for mounting or assembling tires on their rims. The United States Patent No.  
25 6,199,270 to Menard et al. discloses an assembly line for mounting tires on wheels  
including several stations designated for inflating the tire mounted on the wheel,

placement of the bead heels of the tire, and balancing the tire, which also includes apparatus for checking the conformity of the diameter of the tire to be mounted and for checking the conformity of the dimensions of the wheel.

[0004] The United States Patent No. 6,082,191 to Neiferd et al. illustrates an inlet conveyor for conveying tires through a tire uniformity testing system. The conveyor includes a tire centering mechanism and a pair of conveyor belts for delivering tires to a tire testing station. A conveyor elevator may be raised or lowered with respect to the frame unit to raise or lower the support rails and conveyor belts. The support rails and conveyor belts are adjustable in a lateral direction to vary the width of the space between the belts to accommodate different size tires. The conveyor is movable with respect to the testing station to reverse the direction of tire flow through the testing machine. The United States Patent No. 6,082,191 to Neiferd et al. does not teach a method of the assembly line expansion, wherein the assembly line may be easily re-configured or re-shaped thereby adding an extra filler section or unit.

[0005] In addition to the patents, cited above, the United States Patent No. 4,789,015 to Flinn discloses an apparatus for assuring that an uninflated mini tire mounted on a wheel is coaxially centered relative to the wheel prior to the arrival of the mini tire-wheel unit at the inflation station of a tire-wheel assembly line. The assembly line includes a pallet type conveyor comprising a plurality of pallets, which are advanced from left to right of the assembly line. The assembly line includes a tire mounter station and a tire inflator station. Similar to the United States Patent No. 6,082,191 to Neiferd et al., the United States Patent No. 4,789,015 to Flinn does not teach a method of the assembly line expansion, wherein the assembly line maybe easily re-configured or re-shaped thereby adding an extra section or unit.

[0006] Although the prior art assembly lines including wheel orienting,

wheel/tire soaping, tire mounting, and inflating units are used by a wide variety of manufacturers in the automotive industry, one of the areas of continuous development and research is the area of a more advanced design of the assembly line wherein the line is adapted to conform with different floor configurations in an assembly plant or factory.

5 The opportunity remains for a new design of the assembly line, where, unlike typical assembly lines; used in the automotive industry today, the assembly line may be expanded, and easily re-configured or re-shaped, wherein a variety of work stations may be inserted into the assembly line to satisfy different requirements of the manufacturers.

## SUMMARY OF INVENTION

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[0007] The invention discloses an assembly line for mounted units that comprises a conveyor base including a tail section and a head section at the respective ends of the conveyor base. The assembly line further includes a wheel loader assembly attached to the tail section, wherein the wheel loader assembly is designed to position the wheel on a wheel plate at the tail section of the assembly line.

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[0008] The assembly line includes a wheel soaper assembly for applying a first material onto the edges of a wheel, wherein the wheel soaper assembly is attached to the wheel loader assembly and a tire soaper assembly for applying a second material around inner circumference of the tire before mounting the tire about the wheel. The tire soaper assembly is positioned between the tail and head sections of the assembly line.

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[0009] The assembly line includes at least one tire mounter unit for positioning the tire on the wheel. The tire mounter unit is positioned between the tire soaper assembly and the head section of the assembly line. The tire inflator assembly is positioned between the tire mounter unit and the head section of the assembly line. The assembly line includes an inflator probe unit for controlling the pressure of the air in the

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tire. The inflator probe unit is positioned between the tire inflator assembly and the head section of the assembly line.

[0010] The conveyor base of the present invention is comprised of a plurality filler units interconnected with one another to control the length of the assembly line and to add additional units to the assembly line. The filler unit includes top and bottom portions and respective terminal ends. The bottom portion of the filler unit is attached to and extends upwardly from the floor. The terminal ends of the filler unit contact with the respective terminal ends of the filler units positioned on both sides of the filler unit. The top portion of the filler unit is designed to receive a conveyor belt, defining and endless loop extending between the tail and head sections of the assembly line.

[0011] One of the advantages of the present invention provides for a more advanced design of the assembly line wherein the line is adapted to conform to different floor configurations in an assembly plant or factory. Still another advantage of the assembly line provides for a filler unit, wherein a plurality of the filler units are interconnected with one another to control the length of the assembly line and to add additional units to the assembly line that may be expanded and/or easily re-configured or re-shaped to satisfy different requirements of the manufacturers. Accordingly, the assembly line shown in the present invention is new, efficient, and provides for an effective way of transporting and positioning the assembly line on the factory's floor.

#### BRIEF DESCRIPTION OF THE DRAWINGS

[0012] Other advantages of the present invention will be readily appreciated as the same becomes better understood by reference to the following detailed description when considered in connection with the accompanying drawings wherein:



[0013] Figure 1 is a side view of an inventive assembly line;

[0014] Figure 2 is an elevational view of the assembly line;

[0015] Figure 3 is a side view of the assembly line wherein a protection screen is attached around a base portion of the assembly line;

5 [0016] Figure 4 is another side view of the assembly line and front views of different stations and units of the assembly line showing locations of the stations and units with respect to the assembly line;

[0017] Figure 5 is a front view of a filler unit;

[0018] Figure 6 is a top view of the filler unit;

10 [0019] Figure 7 is a cross sectional view of the filler unit; and

[0020] Figure 8 is a fragmental cross sectional view of Figure 7.

#### DETAILED DESCRIPTION OF THE INVENTION

[0021] Referring to the Figures 1 through 8, wherein like numerals  
15 indicate like or corresponding parts throughout the several views, an assembly line of the present invention is generally shown at 10.

[0022] The assembly line 10 for mounted units includes, as shown in Figures 1 through 4, a conveyor base, generally indicated at 12, that further includes a tail section 14 and a head section 16 at the respective ends of the conveyor base 12. The  
20 assembly line 10 further includes a wheel loader assembly 18 attached to the tail section 14, wherein the wheel loader assembly 18 is designed to receive the wheels from a pallet and position the wheel on a wheel plate at the tail section 14 of the assembly line 10. The assembly line 10 further includes a wheel soaper assembly 20 for applying a first lubricating material onto the edges of a wheel, wherein the wheel soaper assembly 20 is  
25 attached to the wheel loader assembly 18. The assembly line 10 includes a tire soaper

assembly 22 for applying a second material around inner circumference of the tire before mounting the tire about the wheel. The tire soaper assembly 22 is positioned between the tail 14 and head 16 sections of the assembly line 10.

[0023] The assembly line 10 includes at least one tire mounter unit 24 for positioning the tire on the wheel. The tire mounter unit 24 is positioned between the tire soaper assembly 22 and the head section 16 of the assembly line 10. The assembly line includes at least one tire inflator assembly 26 for filling the tire with an air. The tire inflator assembly 26 is positioned between the tire mounter unit 24 and the head section 16 of the assembly line 10. The assembly line 10 includes an inflator probe unit 28 for controlling the pressure of the air in the tire. The inflator probe unit 28 is positioned between the tire inflator assembly 26 and the head section 16 of the assembly line 10.

[0024] Referring to Figure 5, the conveyor base 12 of the present invention is comprised of a plurality filler units, generally indicated at 30. Each of the filler units 30 is interconnected with one another to control the length of the assembly line 10 and to add additional units to the assembly line 10. The structure of the filler unit 30 will now be discussed. The filler unit 30 includes top 32 and bottom 34 portions and respective terminal ends 36, 38. The bottom portion 34 of the filler unit 30 is attached to and extends upwardly from a floor 40. The terminal ends 36, 38 of the filler unit 30 contact with the respective terminal ends of the filler units positioned on both sides of the filler unit 30. The top portion 32 of the filler unit is designed to receive a conveyor belt, defining and endless loop extending between the tail 14 and head 16 sections of the assembly line 10.

[0025] Referring to Figure 6, the top portion 32 preferably includes vertical risers, generally indicated at 42, positioned at each of the respective corners of the top portion 32 and defining terminal ends 44, 46, respectively. The risers 42 are

interconnected by horizontal top 48 and bottom 50 beams at the respective terminal ends 44, 46.

[0026] Referring to Figure 8, the bottom beams 50 include at least one sling 52 integral with and extending downwardly from the bottom beam 50. The sling 52 is operably connected with a roller bar 54 at one end 56, wherein a second end 58 of the roller bar 54 includes a roller 60, designed to secure and push forward a wheel holding plate 57 and a tire positioner plate (not shown) at one mode of the operation of the assembly line 10. As appreciated by those skilled in the art, each roller 60 faces the respective roller 60 positioned on the opposite side of the top portion 32 of the filler unit 30. The top portion 32 includes at least one cover plate 62 to cover sidewalls 64 of the top portion 32. As appreciated by those skilled in the art, the cover plate 62 may include a metal, a plastic, or a screen. The top portion 32 of the filler unit 30 further includes top 66 and bottom 68 surfaces to entrain a conveyor belt that includes a plurality of the wheel holding plates 57 and the tire positioner plates located in a consecutive order. The width of the top portion 32 is less than the width of the bottom portion 34 of the filler unit 30.

[0027] Referring back to Figures 6 and 7, the bottom portion 34 of the filler unit 30 includes four vertical posts 70, 72, 74, and 76 interconnected by vertical beams 78, 80, 82, and 84 at the respective terminal ends of the vertical posts. The sidewalls 86, 88 of the bottom portion 34 are covered with a protective screen or guard 90 to provide risk-free working environment at the assembly plant. Each of the vertical posts 70, 72, 74, and 76 of the bottom portion 34 of the filler unit 30 includes a lip 92 integral with and outwardly extending therefrom. The lip 92 includes at least one aperture 94 to receive a bolt, wherein two filler units 30 are secured between one another in the assembly line 10.

[0028] Each of the vertical posts 70, 72, 74, and 76 of the bottom section 34 includes a shoe 96 at the respective bottom terminal ends. The shoe 96 is integral with and outwardly extends from each of the vertical posts 70, 72, 74, and 76 of the bottom section 34. The shoe 96 includes at least one aperture 98 to receive a bolt or a fastener, generally indicated at 100, when the filler unit 30 is mounted to the floor 40 at the assembly plant.

[0029] Obviously, many modifications and variations of the present invention are possible in light of the above teachings. The invention may be practiced otherwise than as specifically described within the scope of the appended claims, wherein that which is prior art is antecedent to the novelty set forth in the "characterized by" clause. These antecedent recitations should be interpreted to cover any combination in which the inventive novelty exercises its utility. In addition, the reference numerals in the claims are merely for convenience and are not to be read in any way as limiting.

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## CLAIMS

What is claimed is:

1. An assembly line for mounted units comprising:  
a conveyor base including a tail section and a head section at the respective ends  
5 of said conveyor base; and  
said assembly line characterized by said conveyor base being comprised of a plurality of filler units, said filler units being interchangeably and removably interconnected with one another to control the length of said assembly line and to add additional units therebetween.
- 10 2. An assembly line as set forth in claim 1 further including a wheel loader assembly attached to said tail section.
3. An assembly line as set forth in claim 2 further including a wheel soaper assembly for applying a first lubricating material onto the edges of a wheel, said wheel soaper assembly attached to said wheel loader assembly.
- 15 4. An assembly line as set forth in claim 3 further including a tire soaper assembly for applying a second material around inner circumference of the tire before mounting the tire about the wheel, said tire soaper assembly positioned between said tail and head sections of said assembly line.
5. An assembly line as set forth in claim 4 further including at least one tire  
20 mounter unit for positioning the tire on the wheel, said tire mounter unit positioned between said tire soaper assembly and said head section of said assembly line.
6. An assembly line as set forth in claim 5 further including at least one tire inflator assembly for filling the tire with air, said tire inflator assembly positioned between said tire mounter unit and said head section of said assembly line.
- 25 7. An assembly line as set forth in claim 6 further including an inflator probe unit

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for controlling the pressure of the air in the tire, said inflator probe unit positioned between said tire inflator assembly and said head section of said assembly line.

FIG-1

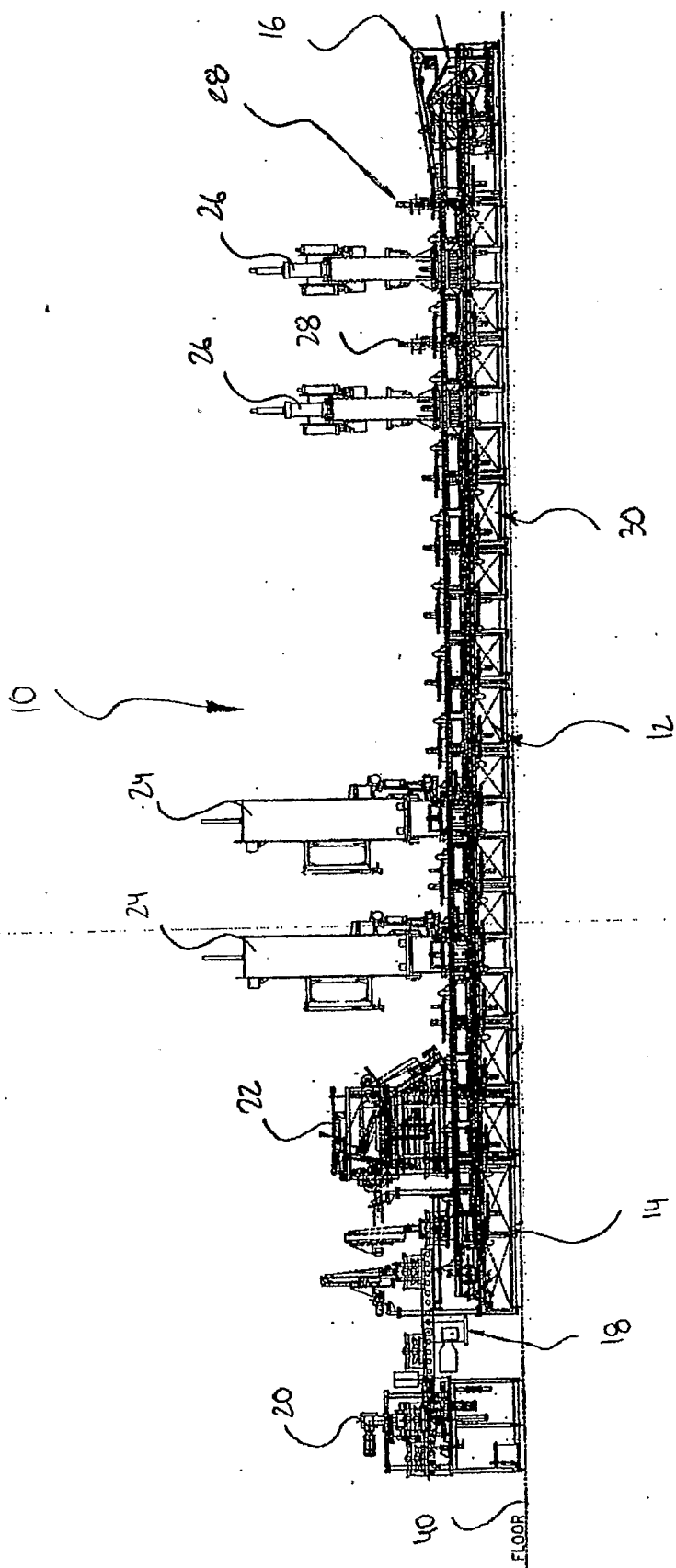


FIG - 2

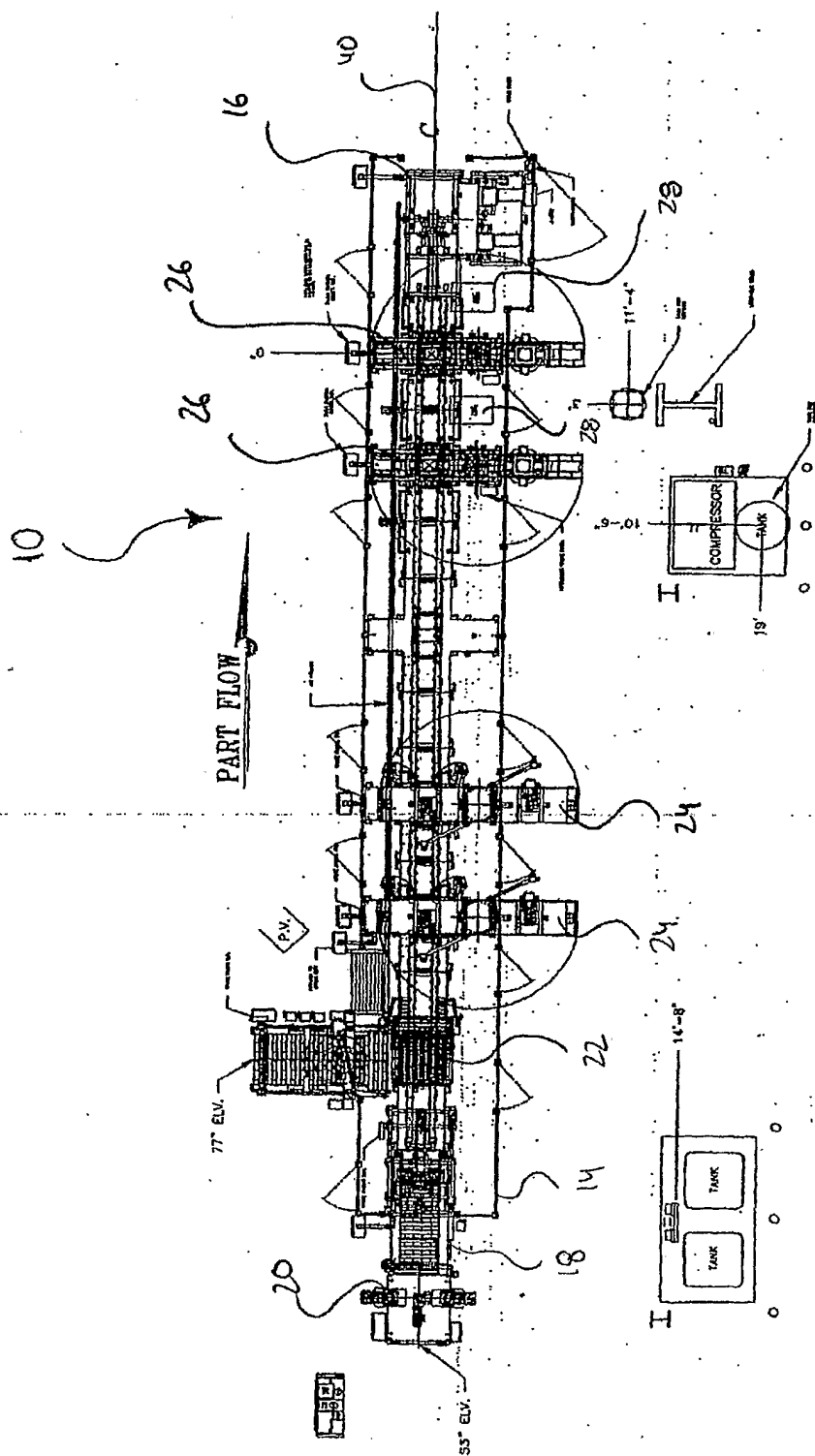
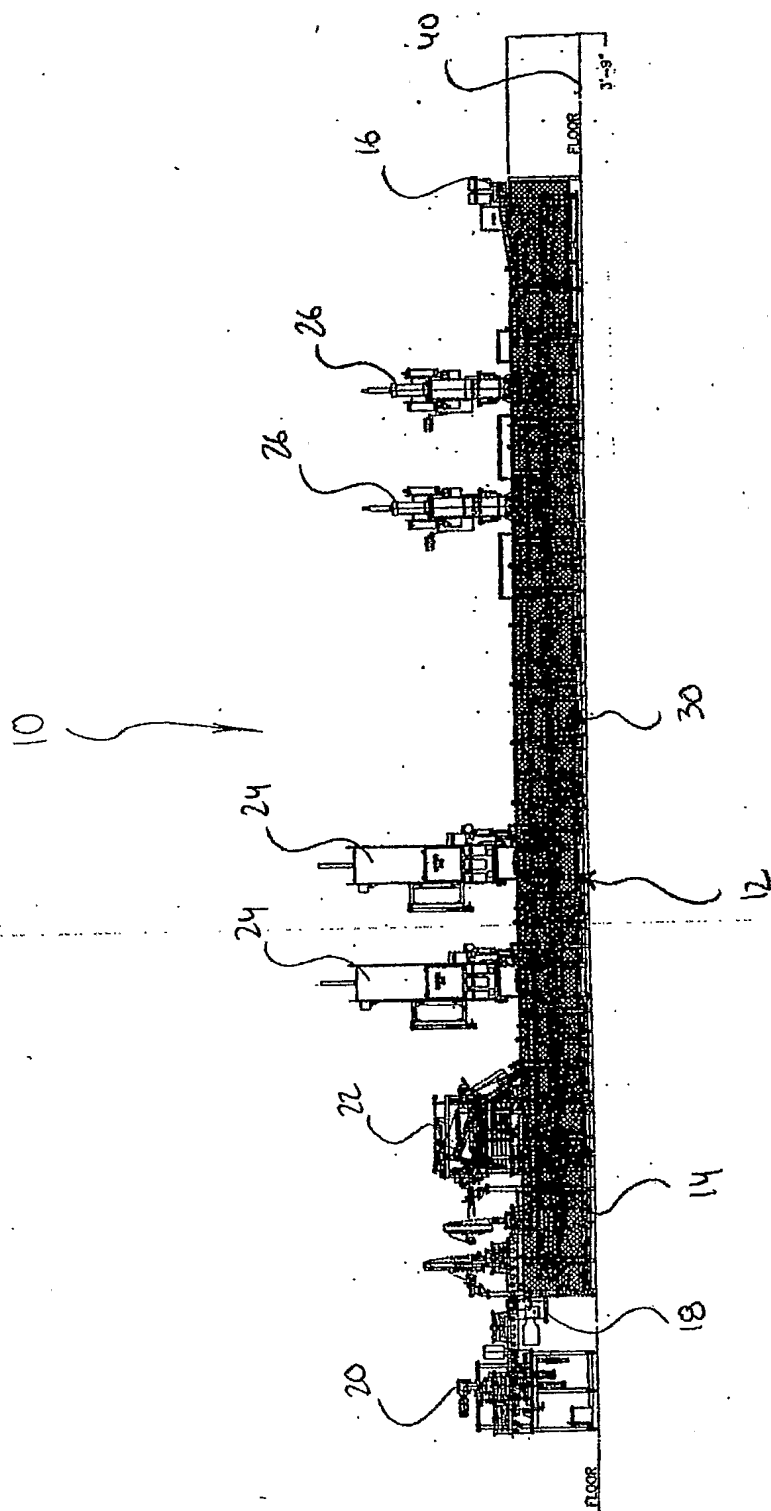




FIG-3



**FIG - 4**

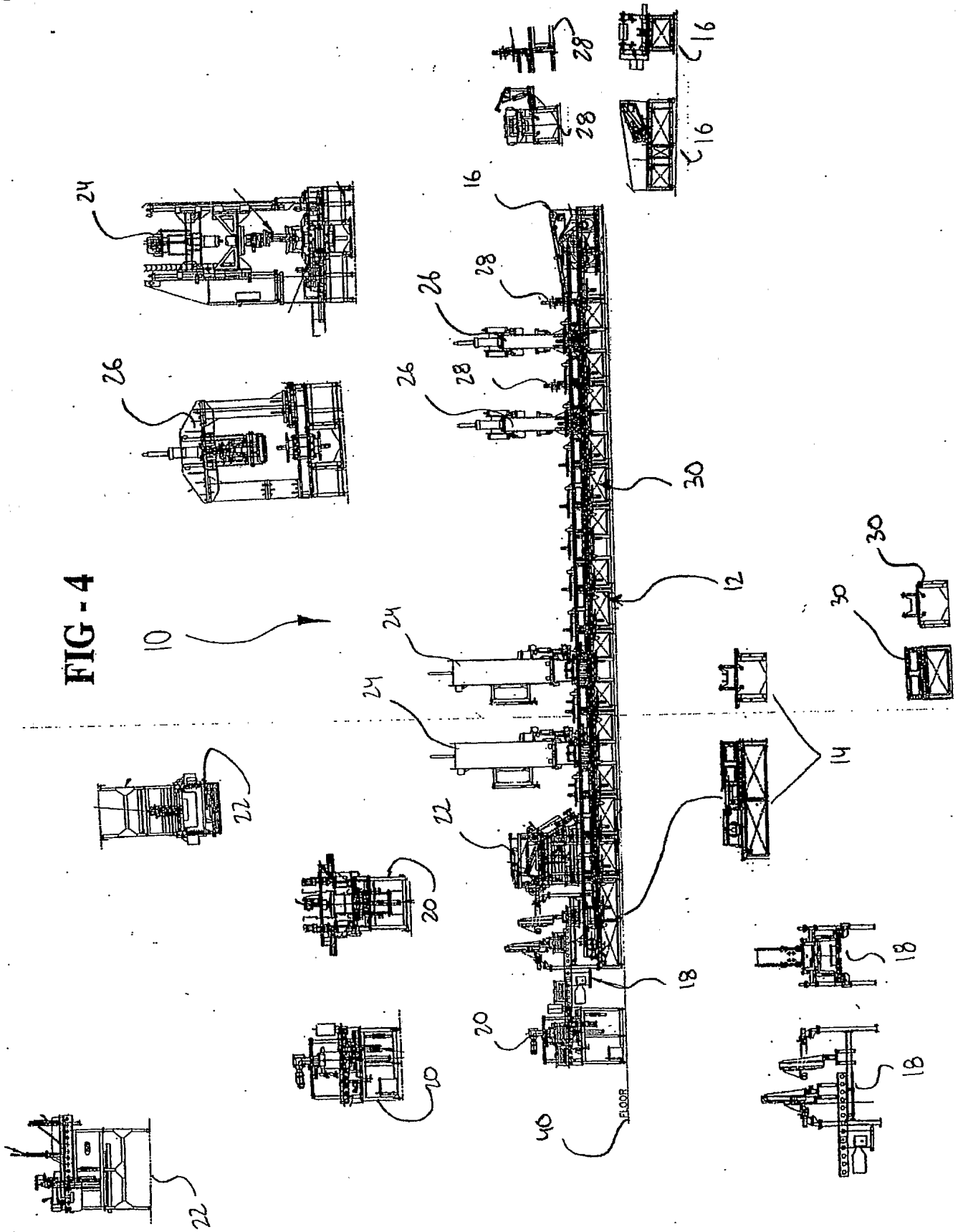






FIG - 7

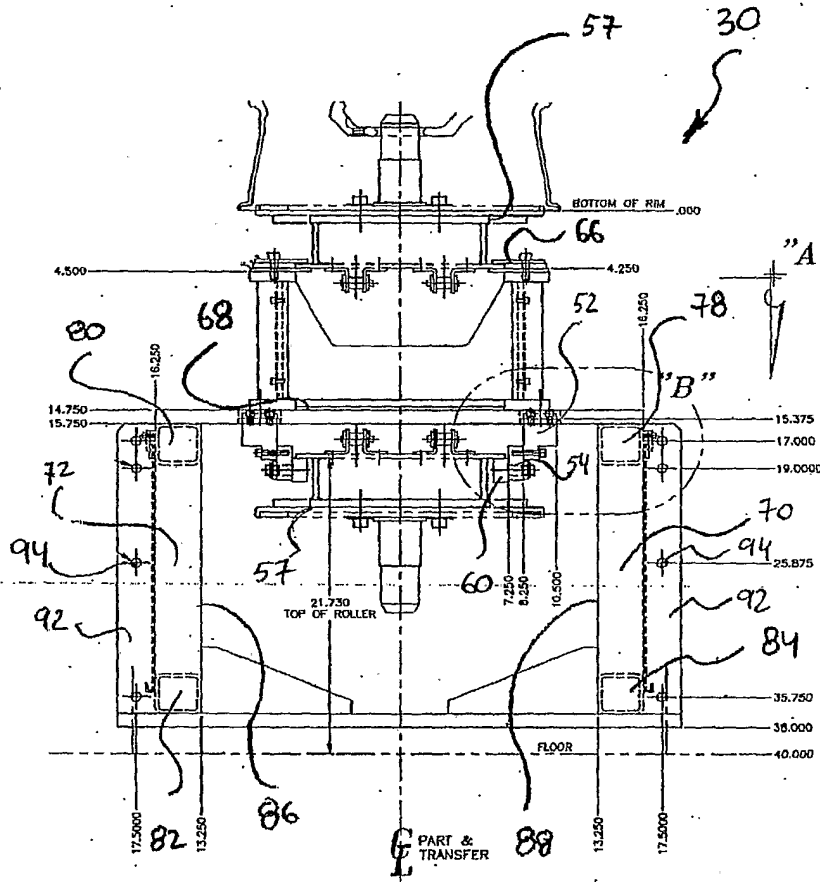


FIG - 8

